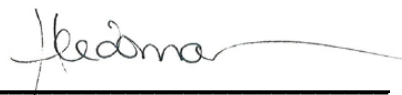


2012 External Validation Review of the Lawrence Berkeley National Laboratory Environmental Management System

Audit Report

6/19/2012



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Every three years, as a Department of Energy (DOE) site, LBNL is required to have a formal audit of its Environmental Management System (EMS) by a qualified party outside of the control or scope of the LBNL EMS. This report outlines findings from the external audit performed June 11-13, 2012 and confirms that LBNL's EMS implementation is in conformance with the ISO 14001:2004 standard.

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Executive Summary

A formal audit of Lawrence Berkeley National Laboratory's (LBNL) Environmental Management System (EMS) was conducted by Jennifer Doman (Lead) from Lawrence Livermore National Laboratory June 11-13, 2012. Mr. Kim Abbott from the Department of Energy (DOE) Berkeley Site Office (BSO) participated as an audit team member.

The purpose of the audit was to confirm that LBNL's EMS conforms to the ISO 14001:2004 standard in accordance with Department of Energy (DOE) Order 436.1 Departmental Sustainability.

The assessors found that LBNL's EMS meets the requirements of the ISO 14001:2004 standard with no major nonconformance.

One minor nonconformance was identified relating to missing inputs to the EMS management reviews. A Corrective Action Plan (CAP) will need to be developed to address this finding. The CAP does not have to be completed prior to the declaration of continuing conformance.

It is recommended that a statement of continuing conformance be issued by the DOE Berkeley Site Office Manager once LBNL has prepared the CAP.

Summarized List of Findings

Minor Nonconformance 1 – Management Review

The EHS Procedure 276 and two recent management reviews performed in 2010 and 2011 do not address all of the required inputs for management review per ISO 14001:2004 4.6 (a-h).

Observation 1 – Document Control

EMS document control may provide inadequate controls to prevent unintended use of obsolete documents.

Observation 2 – Internal Audits

The organization may benefit from re-evaluating the frequency and depth of internal audits of the EMS.

Strength 1 – Safety Coordinators and Programmatic Awareness

The level of environmental awareness demonstrated at the program level was very good. The Division Safety Coordinators appear to be strong advocates for environmental improvement in addition to their safety and health responsibilities. Demonstrated environmental improvements in many areas were noted during the assessment.

Strength 2 – Sustainability Transformation Team

A group of volunteer employees have established a "grassroots" Sustainability Transformation Team that has been successful in promoting environmental stewardship across the Lab. LBNL is encouraged to continue to support and promote these types of activities as opportunities to engage and inform Lab employees about the EMS and LBNL's environmental research contributions.

Strength 3 – EMS Core Team

The EMS Core Team is responsible for determining and prioritizing significant environmental aspects and team members also serve as primary points of contact for the eight environmental management programs (EMPs). The core team meetings serve as an opportunity to share status of each program and to hear about what is going on in other areas. This transfer of information is beneficial since environmental data can be used for other purposes, such as the development of the Site Sustainability Plan, the Site Environmental Report and the annual Pollution Prevention Tracking and Reporting System report to DOE.

Purpose

Lawrence Berkeley National Laboratory (LBNL) is required to implement an Environmental Management System (EMS) in accordance with Executive Order (EO) 13423, *Strengthening Federal Environmental, Energy and Transportation Management*, EO 13514, *Federal Leadership in Environmental, Energy and Economic Performance* and the U.S. Department of Energy (DOE) Order 436.1, *Departmental Sustainability*. Every three years, a formal audit by a qualified party outside the control or scope of the EMS is required to certify that the LBNL EMS continues to conform to the ISO 14001:2004 Standard.

Scope

The scope of this audit was to evaluate continued conformity of the LBNL EMS with the ISO 14001:2004 Standard. All elements of the ISO 14001:2004 Standard were addressed as part of the document review, onsite visit or both. The document review and onsite visit was performed to determine conformance with the standard, consistency between the elements of the EMS as they are implemented within the facility or organization and evidence of continual improvement of the EMS.

Classification of Findings

Findings are reported in four categories:

Major Nonconformance – An issue of major significance that warrants a high level of management attention. Typically an issue of this significance reflects a gap in addressing requirements or a systemic problem with implementing the requirements. If left uncorrected, this level of finding could negatively impact the adequacy of operations, accomplishment of mission or nonconformance with the applicable ISO standard. *The organization is required to develop and complete a Corrective Action Plan (CAP) to address each major nonconformance prior to Field Manager declaration of EMS conformance.*

Minor Nonconformance – A finding that represents a nonconformance, deviation, and/or deficiency in the implementation of requirements, procedures, standards, and/or regulatory requirements. Multiple issues at this level, when of similar nature, may be consolidated into a Major Nonconformance. *The organization is required to develop and adopt a CAP to address each minor nonconformance prior to Field Manager declaration of EMS conformance. Completion of the CAP may occur after declaration.*

Observation - Findings that the assessor deems to be an isolated occurrence or an issue that, if not addressed, could result in a nonconformance or where insufficient information is available to confirm that a nonconformance exists. This level of finding can also include minor deviations observed that have been promptly corrected on the spot and verified as complete prior to the end of the audit. *Action is recommended but not required prior to Field Manager declaration of EMS conformance.*

Strength - A practice or activity that exhibits a level of performance deemed worthy of communicating to other organizations because it is innovative, exemplifies a best practice or may be indicative of the highest level of excellence. *No further action is required.*

Requirements

The following are the applicable regulatory requirements pertaining to the operations assessed:

- Executive Order 13423, Strengthening Federal Environmental, Energy, and Transportation Management.
- Executive Order 13514, Federal Leadership in Environmental, Energy, and Economic Performance.
- DOE Order 436.1, Departmental Sustainability, Attachment 1, Contractor Requirements Document.
- International Organization for Standardization, ISO 14001:2004, Environmental Management Systems – Requirements with guidance for use.
- DOE Office of Health, Safety and Security, Three-Year Audits of the Environmental Management Systems, March 29, 2012.
- Applicable LBNL Environmental Management System documents.
- Applicable LBNL documents

Schedule

A document “desk” review was performed prior to the onsite visit. Background documents reviewed included the EMS policy statement, relevant planning documents such as the list of significant aspects, objectives and targets, and environmental management plans; and the results of recent internal audits and environmental management reviews.

The onsite audit consisted of three auditor days and was performed June 11-13, 2012. An out-briefing with EHS Division senior managers was held following the onsite audit to convey findings. The onsite was augmented with telephone interviews of key individuals who could not be available during the onsite audit due to scheduling conflicts.

Based on assessment results, the DOE Berkeley Site Office (BSO) Manager will issue a Declaration of Conformance to the ISO 14001:2004 Standard.

Audit team members:

- Jennifer Doman (Team Lead) - Lawrence Livermore National Laboratory
- Kim Abbott – DOE Berkeley Site Office

Audit Methodology

The audit methods included document review, interviews and visits to programmatic areas. This performance-based audit verified that requirements are in place in LBNL's procedures and are adequately implemented in practice. The audit approach included:

- Review of procedures, documents and records.
- Interviews with line management, operations and support personnel.

An in-brief was conducted to briefly discuss audit logistics, make any scheduling adjustments and serve as an introduction to the audit process.

Daily debriefing meetings were held to discuss the status of the audit thus far and identify any preliminary findings. A formal out-brief was held on the last day of the onsite audit, at which time the lead auditor provided a verbal summary of audit findings to DOE and LBNL representatives, including EHS Division senior managers.

Audit Results

Nonconformances

Minor Nonconformance 1 – Management Review

The EHS Procedure 276 and two recent management reviews performed in 2010 and 2011 do not address all of the required inputs for management review per ISO 14001:2004 4.6 (a-h).

ISO 14001:2004 4.6 Management Review "Input to management reviews shall include..."

- a) Results of internal audits and evaluations of compliance with legal and other requirements
- b) Communications from external interested parties
- c) Environmental performance of the organization
- d) The extent to which objectives and targets have been met
- e) Status of corrective and preventative actions
- f) Follow-up actions from previous management reviews
- g) Changing circumstances, including developments in legal and other requirements
- h) Recommendations for improvement

Observations

Observation 1 – Document Control

EMS document control may provide inadequate controls to prevent unintended use of obsolete documents.

ISO 14001:2004 4.4.5 Document Control (g) "The organization shall ... prevent the unintended use of obsolete documents and apply suitable identification to them if they are retained for any purpose."

Observation 2 – Internal Audits

The organization may benefit from re-evaluating the frequency and depth of internal audits of the EMS to ensure that the findings from the audits identify nonconformances with the ISO standard.

ISO 14001:2004 4.5.5 Internal Audit states that “Audit programme(s) shall be planned, established, implemented and maintained by the organization, taking into consideration the environmental importance of the operation(s) concerned and the results of previous audits.”

Strength 1 – Safety Coordinators and Programmatic Awareness

The level of environmental awareness demonstrated at the program level was very good. The Division Safety Coordinators appear to be strong advocates for environmental improvement in addition to their safety and health responsibilities. Demonstrated environmental improvements in many areas were noted during the assessment.

Strength 2 – Sustainability Transformation Team

A group of volunteer employees have established a “grassroots” Sustainability Transformation Team that has been successful in promoting environmental stewardship across the Lab. LBNL is encouraged to continue to support and promote these types of activities as opportunities to engage and inform Lab employees about the EMS and LBNL’s environmental research contributions.

Strength 3 – EMS Core Team

The EMS Core Team is responsible for determining and prioritizing significant environmental aspects and also serve as primary points of contact for the eight environmental management programs (EMPs). The core team meetings serve as an opportunity to share status of each program and to hear about what is going on in other areas. This transfer of information is beneficial since environmental data can be used for other purposes, such as the development of the Site Sustainability Plan, the Site Environmental Report and the annual Pollution Prevention Tracking and Reporting System report to DOE.

Narrative

The Earth Sciences Division (ESD) laboratory in B70A-R2253 demonstrated a good understanding of the environmental aspects of their research activities. The ESD Safety Coordinator has incorporated environmental protection and waste minimization into the orientation training for all ESD new hires, which is held monthly (with rare exception). Environmental stewardship by ESD employees is recognized and rewarded as evidenced by a recent EHS Safety Spot Award for employee innovation in recycling of excess sample gel packs. Laboratory practices include waste minimization through trying least hazardous extraction techniques first when new samples are received. This process is generally successful about 70% of the time. In addition, collaboration with a neighboring lab space allows researchers to borrow instrumentation that can help to increase purity for extracted samples. Robotic processes are being explored for sample handling to further reduce waste. This also has an added ergonomic benefit. Engaging all program Safety Coordinators may provide an opportunity to expand the depth of the LBNL environmental management system.

A new assessment program is under development with the first pilot implemented within the coming week. The intent of the new program is to augment technical activity progress reports (TAP) with an

interactive presentation summary to management. The TAP reports are prepared by the various subject matter experts and address environmental compliance. The pilot format for the TAP may present an opportunity to strengthen the LBNL EMS management review by providing an additional venue for management awareness and engagement. The first two pilot presentations will be from the Waste Management Group, covering satellite accumulation areas and medical waste, and the Occupational Safety Group, covering cranes and hoists. The environmental management system, under the Environmental Services Group, is also part of the pilot, with a presentation slated for the July-August timeframe.

A water recycling project was undertaken to reuse laboratory hazardous wastewater after treatment to neutralize acidity. The treated non-hazardous wastewater is reused in the Building 70A cooling tower, and saves over 500,000 gallons of water a year. LBNL is encouraged to capture this type of information in either the EMPs or some other vehicle so that a more comprehensive compilation of environmental achievements is documented and available.

The Engineering Division's Ultra High Vacuum Cleaning Facility has made a number of recent environmental improvements. For example, they have eliminated the need to store large volumes of concentrated acids, and instead order acid only when tanks need to be replenished. Acids are purchased and immediately used in the tank, avoiding storage and reducing both environmental and safety risks. Legacy chemicals have been removed and a general practice has been established to evaluate chemicals whenever a change of chemical custodian is initiated. They have also recently incorporated a significant product substitution in one of their processes. They replaced a product that contained a hazardous material (hexavalent chromium) with one that is not hazardous. The Engineering Safety Coordinator has shared some of these good environmental practices at the monthly Division Safety Coordinator meetings.

Procurement has a well established and monitored sustainable acquisition program. Purchases of EPEAT desktop computing items, toner cartridges and recycled-content paper are regularly monitored for continued performance. Vendor catalogs are reviewed to highlight preferential purchasing of greener office products.

Appendix

Documents and Records Reviewed

- *Registration Audit Report* 8Y161 28-Apr-2001. Willem Lamers, NSF International Strategic Registrations, Ltd.
- *Annual Management Review of LBNL's Environmental Management System* 04-May-2011
- *Annual Management Review of LBNL's Environmental Management System* 23-Sep-2010
- EHS Procedure 271 Revision 4 01-Jun-2012 *EMS Implementation (Core) Team*
- EHS Procedure 272 Revision 5 01-Jun-2012 *Identification of Significant Environmental Aspects and Impacts for the EMS*
- EHS Procedure 273 Revision 5 01-Jun-2012 *Environmental Management Programs of the EMS*
- EHS Procedure 274 Revision 4 01-Jun-2012 *EMS Training*
- EHS Procedure 275 Revision 4 01-Jun-2012 *EMS Assessments and Audits*
- EHS Procedure 276 Revision 3 01-Jun-2012 *Management Review of the EMS*
- *Environmental Management System Internal Assessment Report* 28-Sep-2010 Richard Cellemare
- *Internal Assessment of the LBNL Performance-Based Environmental Management System*, September 2008
- LBNL/PUB 3180 *Environmental Management System Plan* Revision 05-May-2012
- *Validation Audit Report*. NSF International Strategic Registrations, Ltd. 20-Sep-2005
- LBNL-1636E *Environmental Compliance Audit & Assessment Program Manual* Revision 1, March 2009
- LBL-27170 (2011) *Site Environmental Report for 2010* Volume I, September 2011
- *Citation of Conformance* for the LBNL Environmental Management System (EMS). NSF International Strategic Registrations. 19-May-2009.
- *LBNL Environmental Management System* webpage, accessed 5/25/2012, 6/7/2012.
<https://commons.lbl.gov/display/sustainlbl/Environmental+Management+System>
- LBNL EMP 05-01D Revision 3/25/2012 – Diesel Particulate Matter Air Emissions aspect
- LBNL EMP 07-04 Revision 3/13/2012 – Traffic Congestion & GHG Reporting aspects
- LBNL EMP 07-02B Revision 3/13/2012 – Water Use aspect
- LBNL EMP 07-05B Revision 5/24/2012 – Petroleum Use aspect
- LBNL EMP 10-01I Revision 3/13/2012 – Greenhouse Gas Emissions aspect
- LBNL EMP 07-01B Revisions 3/13/2012 and 3/01/2011 – Energy Use aspect
- LBNL EMP 04-05 Revisions 2/29/2012, 2/28/2011 and 8/1/2010 – Procurement aspect
- LBNL EMP 07-03B Revisions 5/4/2012, 4/1/2011 and 9/14/2010 – Solid waste generation aspect
- Email guidance memo from Andrew Peterson re: pilot wave of TAP report to Program Management Review transition 6/1/2012.
- LBNL-913E *Environment, Safety, and Health Technical Assurance Program Manual* Rev 3, June 2011
- LBNL Aspect ID & Sig worksheet.xls, March 1, 2012 (online record)
- Environmental Services Group Whom to Call List by Activity, revised March 28, 2012 (website)
- Semi-Monthly Activity Report to Environmental Services Group Leader, dated May 16-31, 2012

- Activity Report for Robert Fox, dated June 5, 2012
- LBNL Stormwater Management: Bullet Point Overview of Goals, dated week of June 6, 2012
- Earth Sciences Division ESD Safety Orientation, April 20, 2012
- EHS Safety Spot Award Nomination form for ESD employee efforts to promote recycling of uncontaminated ice packs, dated March 20, 2012.
- Emergency Response Guide, document 13948 Revision 2008.
- ESD Inspection Checklist – SAA
- Fleet Petroleum Fuel Usage for FY2011, memo (ESG-12-108) from Robert Fox to Patrick Thorson, dated May 30, 2012
- U.S. Environmental Protection Agency ECHO Report for UC Lawrence Berkeley Labs
- ESG Internal Documents Procedure Table (web page)
- Summary of NESHAP Sampler Calibration for 70A-2211 (as of 6/12/2012)
- Office of Contractor Assurance FY12 Institutional Assessment Schedule
- Quarterly Inspection Worksheet for NESHAP Samplers (dated 4/12/2012)
- Field Calibration Worksheet for (Alicat) Air Samplers (dated 4/6/2012)
- LBNL Facilities Sustainability Report 2011
- CSO 21915 Berkeley Lab Facilities Brochure
- Attachment J.9 to Appendix I of Contract DE-AC02-05CH11231
- Part II of Section I of Contract DE-AC02-05CH11231
- EHS Training 0010 Module 2

Organizations Included in Assessment

- Directorate
- Environment, Health and Safety Division
- Earth Sciences Division
- Engineering Division
- Facilities Division
- Information Technology Division
- Office of Chief Financial Officer
- Office of Contractor Assurance

Individuals Interviewed

Directorate

- John Elliott, Chief Sustainability Officer
- Melissa Summers, Carbon Cycle 2.0 Campaign Manager / Sustainability Transformation Team Leader

Earth Sciences Division

- Vivi Fissekidou, Division Safety Coordinator
- Yvette Piceno, Ecology Department, Staff Research Associate

Engineering Division

- Chris Redding, Mechanical Technician
- Weyland Wong, Division Safety Coordinator

Environment, Health and Safety Division

- James Basore, Training Manager
- Robert Fox, Environmental Services Group, Environmental Specialist
- John Jelinski, Environmental Services Group, Quality Coordinator
- David Kestell, Environment, Waste and Radiation Protection Department Head
- Ron Pauer, Environmental Services Group Leader
- Andrew Peterson, Assurance Manager
- Nancy Rothermich, Waste Management Group Leader
- Jack Salazar, Deputy Director, Technical Programs
- Rocky Saunders, Emergency Services Manager
- Patrick Thorson, Environmental Services Group, EMS Program Manager

Facilities Division

- Blair Horst, LBNL Sustainability Coordinator and Energy Manager

Information Technology Division

- Adam Stone, Deputy Chief Information Officer

Office of Chief Financial Officer

- John Speros, Procurement Group Manager, Policy, Assurance and Systems

Office of Contractor Assurance

- John Chernowski, Manager
- Theresa Triplet, Issues Management Program / CATS Database Manager